**Abductor Digiti Minimi**: Pisiform & tendon of flex. Carpi ulnaris, proximal phalanx of 5th digit, abd. 5th finger, ulnar N (C8,T1)

**Abductor Hallucis**: Calcaneous, Medial side of proximal phalanx of great toe, abd great toe, med. plantar N (L4-5)

**Abductor Pollicis Brevis:** abd/assists opposition of thumb, median N (C8-T1)

**Abductor Pollicis Longus:** abd/ext. thumb & abd. wrist, Radial N (C6-8)

**Adductor Brevis:** adduct thigh, obturator N (L3,4)

**Adductor** **Hallucis**: adduct big toe, lat plantar N (S1,2)

**Adductor** **Longus**: ant. body of pubis, med. 1/3 of med. lip of linea aspera of femur, add/flex thigh, assists med. rotation, obturator N (L3-4)

**Adductor** **Magnus**: inferior ramus of pubis/ischial tuberosity, hamstring: linea aspera of femur, Adductor: add tubercle of femuradd/ext. thigh,

obturator N (adductor) Tibial div of Sciatic (hamstring) (L2-4)

**Adductor** **Pollicis**: add/flex thumb, ulnar N (C8-T1)

**Anconeus**: ext. forearm & stabilize elbow, radial N (C6-8)

**Biceps** **Brachii**: Supraglenoid tubercle of scapula, radial tuberosity, bicipital aponeurosis, flexes & supinates forearm, Musculocutaneous N

**Biceps** **Femoris**: flex/lat rotate knee, ext thigh, tibial/fibular sciatic NN (L5-S2)

**Brachialis**: Distal ½ of ant. surface of humerus, Coronoid process & tuberosity of ulna, primary flexor of forearm, Musculocutaneous N (C5-6)

**Brachioradialis**: lateral supracondylar ridge of humerus, styloid process of radius, flex forearm, assists pro/supination of forearm, Radial N

**Coracobrachialis**: tip of coracoid process of scapula, middle medial shaft of humerus, flexion/add. of humerus, musculocutaneous N (C5-7)

**Coccygeus**: ischial spine & sacrospinous lig, coccyx & lower sacrum, supports viscera, closes pelvic outlet, S4,5 NN

**Cricoarytenoid**: cricoid cartilage, arytenoid cartilage, adduction of vocal fold, laryngeal vagus N

**Deltoid:** acromial end of clavicle, acromion and spine of scapula, Deltoid tuberosity of humerus, flex, abd, extend, lat/med rotate arm, Axillary

**Diaphragm:** L1-3, lower 6 costal cart, xiphoid process & sternum, form central tendon, flattens to increase height of thorax, phrenic N

**Extensor Carpi Radialis Brevis**: ext. wrist & assists abd. of hand, radial N (C6-7)

**Extensor Carpi Radialis Longus:** ext. wrist & abd. hand, radial N (C6-7)

**Extensor Carpi Ulnaris**: extends wrist & assists adduction of hand, interosseus radial N (C6-8)

**Extensor Digiti Minimi**: ext. 5th digit, radial N (C6-8)

**Extensor Digitorum**: ext. fingers & wrist, deep radial N (C6-8)

**Extensor Digitorum Brevis**: ext metatarsalphalangeal joints, deep fibular N (L5-S2)

**Extensor Digitorum Longus:** ext phalanges, deep fibular N (L4-S1)

**Extensor Hallucis Brevis**: ext metatarsalphalangeal joints, deep fibular N (L5-S2)

**Extensor Hallucis Longus**: ext/dorsiflex big toe, deep fibular N (L4-S1)

**Extensor Indicis**: ext. index finger @ metacarpalphalanx joint, post. interosseus radial N (C6-8)

**Extensor Pollicis Brevis**: ext. thumb & abd. hand, radial N (C6-7)

**Extensor Pollicis Longus**: ext. interphalangeal joints & assists ext. of metacarpophalangeal joints in thumb, also assists abd. & ext. of wrist &

lat. thumb rotation, post. interosseus radial N (C6-8)

**External Oblique**: ext lower 8 ribs, ant iliac crest, linea alba, compress abdominal cavity, flex/rotate vert column, ventral rami of T7-T12

**Flexor Carpi Radialis**: flex wrist & abduction hand, median N (C6-7)

**Flexor Carpi Ulnaris**: flexes/adducts wrist, ulnar N (C7-8)

**Flexor Digiti Minimi Brevis (foot)**: Metatarsal V, Proximal Phalanx of 5th Digit flex MP joint of toe 5, lat. plantar N (S1-2)

**Flexor Digitorum Brevis**: flex proximal phalanges, med plantar N (L4,5)

**Flexor Digitorum Longus**: flex distal phalanges of toes, tibial N (L5, S1)

**Flexor Digitorum Profundus**: ant. surface of distal phalanges of fingers 2-5, flex wrist, 2nd-5th MP, PIP, DIP joints, ulnar N (medial ½) &

median N (lateral ½)

**Flexor Digitorum Superficialis**: sides of middle phalanges 2-5, flex. Wrist, 2nd-5th MP and PIP joint, median N (C7-T1)

**Flexor Hallucis Brevis**: flex metatarsalphalangeal joint of big toe, med plantar N (L4-S1)

**Flexor Hallucis Longus**: flex big toe, plantar flex, tibial N (L5-S2)

**Flexor Pollicis Brevis**: abd/assists opposition of thumb, median N (C8-T1)

**Flexor Pollicis Longus**: flex thumb, ant. Interosseus median N (C8-T1)

**Geniohyoid**: inferior mental spine, ant hyoid bone, pulls hyoid sup/ant, C1-Hypoglossal NN

**Gluteus Maximus**: iliac crest, scrum, coccyx, iliotibial tract of fascia lata, linea aspera and gluteal tuberosity of femur, extends thigh, laterally

rotates thight, Inf. gluteal N (L5-S2)

**Gluteus Medius**: Posterior iliac crest, lateral surface between posterior and anterior gluteal lines, Greater trochanter of femur, Abducts thigh,

medially rotates thigh Superior Gluteal N (L5-S2)

**Gluteus Minimus**: Lateral surface of ilium between inferior and anterior Gluteal lines, Greater trochanter of femur, abducts thigh, medially

rotates thigh, Superior Gluteal N (L5-S2)

**Gracilis**: add. thigh & flex knee, obturator N (L3,4)

**Gastrocnemius**: superior posterior surfaces of lateral/medial condyles, calcaneous (via calcaneal tendon) plantar flex foot, flex leg, Tibial N

**Hyoglossus**: hyoid bone, inf/lat tongue, depress tongue, draw side down, hypoglossal N

**Iliacus**: ant/inf iliac spine & iliac crest, lesser trochanter of femur, flex hip, femoral (L2-4)

**Iliocostalis** **Cervicis, Lumborum, Thoracis**: tendon from posterior part of iliac crest posterior sacrum, lumbar spinous processes, angles of

ribs, TP of cervical vertebrae, extend neck and vertebral column, maintain posture, cervical, thoracic, lumbar spinal NN

**Infraspinatous**: Infraspinous fossa of scapula, greater tubercle of humerus, adduct/laterally rotate arm, Suprascapular N (C5, C6)

**Intercostals**: external=inspiration, internal=expiration, innermost=expiration🡪primary breathing mm, Intercostal NN

**Internal Oblique:** lat ½ of inguinal lig, ant 2/3 of iliac crest, thoracolumbar fascia, cart of last 3 ribs, compress abdominal contents, let

bend/rotate vert column, ventral rami of T7-T12 & L1

**Interossei**: lat plantar N (S1,2)

**Interosseous**: deep branch of ulnar N (C8-T1)

**Interspinalis**: Extends vertebral column, rotates vertebral column to the opposite side

**Intertransversarii**: Lateral flexion of vertebral column

**Latissimus** **Dorsi**: SP of T7-T12, ribs 8-12, thoracolumbar fascia& iliac crest, intertubercular groove of humerus, Ext., add., & med. rotates

arm; prime mover of arm ext, Thoracodorsal N (C6-C8)

**Levator** **Ani**: inner ischial spine & pelvic surface of pubis, inner coccyx, forms floor of pelvic cavity, S4 & inf rectal N

**Levator Costarum:** elevates ribs during inhalation

**Levator** **Scapulae**: TPs of C1-C4, superior part of medial border of scapula, elevates scapula, inferiorly rotates scapula,C3/C4 and dorsal

scapular N

**Longissimus** **Capitis, Cervicis, Thoracis**: tendon from posterior part of iliac crest, posterior sacrum, lumbar SP, mastoid process of temporal

bone and TP of cervical/thoracic vertebrae, extends neck, vertebral column, rotates head, maintains posture Cervical and Thoracic Spinal NN

**Lumbricals (hand)**: tendons of flex. digit. profundus, dorsal tendons on fingers 2-5, flex. of 2nd-5th MP, extend 2-5th PIP, Median N

(lat lumb 1,2) Ulnar N (med lumb 3,4)

**Lumbricals (foot):** tendons of flex. digit. longus m, tendons of ext. digit. longus, flex MP extends DIP/PIP of toes 2-5, Medial plantar

(1st lumbrical) 1,2) Lateral plantar (2nd-4th lumbricals)

**Multifidis**: Sacrum and TP of each vert, SP of vertslocated 2-4 segments superior to origin, extends vertebral column, rotates vertebral column

towards opposite side, Cervical, Thoracic, Lumbar Spinal NN

**Oblique Capitis inferior:** SP of atlas, TP of Atlas, Turns head to the same side, Suboccipital N

**Oblique Capitis Superior:** TP of Atlas, Inferior Nuchal line of occipital bone, Turns head to the same side, Suboccipital N

**Obturator Internus**: Laterally rotates thigh

**Opponens Digiti Minimi**: opposes pinky w/ thumb, ulnar N (C8-T1)

**Opponens Pollicis:** flexor retinaculum & hamate bone, proximal phalanx of 5th finger, rotates thumb into opposition w/ fingers, ulnar N (C8)

**Palmaris Brevis:** corrugates skin of palm, ulnar N (C8)

**Palmaris Longus:** flex wrist, median N (C6-8)

**Pectineus**: pectineal line of pubis, pectineal line of femur, flex & add. femur @ hip, femoral N (L2-4) or obturator N (L2-L4)

**Pectoralis Major:** Ventral surface of sternum down to 7th rib, sternal half of clavicle (medial), costal cart. of ribs 2-6, Lat. lip of intertubercular

groove of humerus, Add. & med. rotates arm, clavicular head flexes humerus, sternal head ext. humerus, assists elevation of

thorax, Med./lat. pectoral NN (C5-C8, T1)

**Pectoralis Minor:** draws scapula ant & down, draws rib cage sup, Medial pectoral N (C8, T1)

**Peroneus(fib) Brevis:** midlateral shaft of fibula, base of 5th metatarsal, plantar flex/eversion of foot, superficial fibular N (L4-S1)

**Peroneus(fib) Longus:** Base of metatarsal I; medial cuneiform bone plantar flex & eversion of foot, superficial fibular N (L4-S1)

**Peroneus**(**fib) Tertius**: lower 1/3 of ant. fibula & interosseus membrane, dorsal surface of base of 5th metatarsal, dorsiflex./eversion of foot,

deep fibular N (L4-S1)

**Piriformis**: Anterolateral surface of sacrum, Greater trochanter of Femur, laterally rotates thigh, N to Piriformis S1-S2

**Plantaris**: lat. supracondylar ridge of femur & oblique popliteal lig., post calcaneous, plantar flex of foot, tibial N (L4-S1)

**Popliteus**: flex/med rotates knee, tibial N (L4-S1) O In A N

**Pronator** **Quadratus**: distal ¼ of ulna, distal ¼ of radius, pronates forearm, median N

**Pronator** **Teres**: above med. epicondyle of humerus, med. side of coronoid process of ulna, middle of lat. surface of radius, pronates forearm

& assists flexing elbow, Median N (C6-7)

**Psoas** **Major**: TP of L1-5, body of T12 & L1-5, lesser trochanter of femur, flex hip & vert column, ventral rami of L2-4

**Quadratus** **Femoris**: Upper part of lat. border of ischial tuberosity, Trochanteric crest of femur, Lat. rotates thigh @ hip joint, Branch from

sacral plexus (L5 & S1)

**Quadratus** **Lumborum**: iliolumbar lig & post iliac crest, inf last rib & TP of L1-L4, flex lumbar vert column lat, ventral rami of T12 & L1-3

**Quadratus** **Plantae**: lat. side of flex. digit. longus tendon, flex. of terminal phalanges of 2nd-5th toes, lat. plantar N (S1-2)

**Rectus** **Abdominis**: crest of pubis/pubic symphysis, cart of ribs 5-7 & xiphoid process, flex vert column, ant primary rami of 7-12 intercostalN

**Rectus** **Capitis** **Posterior** **Major**: SP of axis, Inf nuchal line of occipital bone, extends head/neck, Suboccipital N

**Rectus Capitis Posterior Minor:** Posterior tubercle of atlas, inf nuchal line of occipital bone, extends head/neck, Suboccipital NN

**Rectus Femoris**: ant/inf. Iliac spine, quad tendon to patella, patellar ligament to tibial tuberosity, ext. leg @ knee @ flex thigh @ hip, femoral

**Rhomboid Major:** SP of T2-T5, med. border of scapula superior to spine, Add., retracts, elevates, & inf rotates scapula, Dorsal scapular N

**Rhomboid Minor:** SPs of C7 & T1, med. border of scapula superior to spine, elevate, retract (add), inf rotate scapula, Dorsal scapular N (C5)

**Rotatores:** TP of each vertebra, SP of immediately superior verts, extends vertebral column, rotates vertebral column toward opposite side,

Cervical, Thoracic, and Lumbar spinal NN

**Scalene**: TP of C2-7, upper 1st & 2nd rib, lat flex neck @ that side & elevates ribs 1-2, ventral rami of C4-C8

**Semispinalis Capitis, Cervicis**: TP of C4-T12, Occipital bone/SP of cervical/thoracic verts, Bilat: extends vertebral column and neck, unilat:

laterally flex vertebral column/neck, Cervical and thoracic spinal NN

**Semimembranosus**: flex knee, ext thigh, tibial sciatic N (L5-S2)

**Semitendinosus**: Ischial tuberosity, proximal medial surface of tibia, flex/med. rotates leg @ knee & ext. thigh @ hip, tibial portion of sciatic

**Serratus Anterior:** Ribs 1-8, ant/superior margins, medial border of scapula, ant surface, prime mover in scapula protraction, sup

rotate/stabalize scapula, Long thoracic N (C5-C7)

**Serratus Posterior Inferior**: SP of T11-L2, Inf. borders of ribs 8-12, Depresses ribs during exhale, Thoracic Spinal NN

**Serratus Posterior Superior:** SP C7-T3, Lat Borders of ribs 2-5, Elevates ribs during inhale, Thoracic Spinal NN

**Soleus**: Plantar flex, tibial N (S1,2)

**Spinalis Capitis/Cervicis/Thoracis**: Lumbar SP (thoracic) and C7 SP (cervical), SP of axis and thoracic vert, extends neck and vertebral

column; maintains posture, Cervical and thoracic spinal NN

**Splenius Capitis/Cervicis**: Ligamentum Nuchae, Occipital bone and mastoid process of temporal bone, Unilat: turns head to same side, Bilat:

extends head/neck, Cervical Spinal NN

**Sternocleidomastoid**: Manubrium and sternal end of clavicle, mastoid process, lat flex/rotate head, flex neck, spinal accessory CNXI

**Subclavius**: Stabilizes and depresses clavicle, N to Subclavius C5-C6

**Subscapularis**: Subscapular fossa of scapula, Lesser tubercle of humerus, Med. rotates arm, Upper/lower subscapular NN (C5, C6)

**Superior Gemellus:** Ischial spine/tuberosity, Obturator internus tendon, Laterally rotates thigh, N to Obturator internus

**Supinator**: Supinate forearm, radial N (C6) **Subcostal M**: elevating ribs during inhalation, spans 3 ribs

**Supraspinatus**: Supraspinous fossa of scapula, Greater tubercle of humerus, Abd. arm Suprascapular N (C5, C6)

**Tensor** **Fasciae** **Latae**: assists thigh motion & stabilizes hip, sup. gluteal N (L4-S1)

**Teres** **Major**: Inf lateral border/inferior angle of scapula, lesser tubercle and intertubercular groove of humerus, extend, med rotate, add arm,

Lower subscapular N

**Teres** **Minor**: Upper dorsal lateral border of scapula, sup to teres major, greater tubercle of humerus, Add/ Lat rotate arm, Axillary N (C5)

**Tibialis** **Anterior**: Lateral condyle and proximal shaft of tibia, interosseous memb, metatarsal I and first cuneiform dorsiflex/inversion of foot,

Deep fibular N (L4-S1)

**Tibialis** **Posterior**: Fibula, Tibia, Interosseous membrane, Metatarsal II-IV; navicular/cuboid bone, all cuneiforms, plantar flex & inversion of

foot, tibial N (L5, S1)

**Transverse** **Abdominis**: Lat inguinal lig, iliac crest, cart of ribs 7-12, thoracolumbar fascia, abdominal apaneurosis to linea alba, constrict

abdomen & support viscera, ventral rami of T7-T12 & L1

**Transverse** **Thoracis**: inner sternum, xiphoid process, inner costal cart of ribs 2-6, draw ventral rib down, intercostal NN

**Trapezius**: Superior nuchal line of occipital bone, ligamentum nuchae, SP C7-T12, Lat. 1/3 of clavicle; acromion process & spine of scapula,

elevate, superiorly rotate/retract/depress scapula, Accessory N CNXI

**Triceps** **Brachii**: LH: inferior lateral border and inferior angle of scapula, olecranon process of ulna, ext/add arm, Radial N (C7-8)

**Vastus** **Intermedius**: extend knee, femoral N (L2-4) **Vastus** **Lateralis**: extend knee, femoral N (L2-4)

**Vastus** **Medialis**: intertrochanteric line/linea aspera of femur, Quadriceps tendon to patella/patellar lig tuberosity, extend leg @ knee,

Femoral N

ANTERIOR SCALENE: bends cerv part of vert column forward and lat and assists in elevation of 1st rib; vent rami of C4-C6

CORRUGATOR SUPERCILLII: Pulls eyebrows inferiorly and medially; creates verticle wrinkles above nose; Facial Nerve

DEPRESSOR ANGULI ORIS: draws angle of mouth Inferiorly and Laterally; facial N (CNVII)

DIGASTRIC: Depresses mandible, elevates hyoid bone, Anterior belly: (Mandibular CNV3); posterior: Facial N CNVII

EXTERNAL PHARYNGEAL CONSTRICTORS (superior, middle, inferior): constricts pharynx in sequence to force bolus into esophagus;

FRONTALIS: moves scalp, eyebrows; wrinkles skin of forehead; facial N (CNVII)

INFRAHYOID AND SUPRAHYOID: depressor/ elevator of larynx & hyoid

LATERAL PTERYGOID: Protracts mandible; produces side to side movement of mandible, Mandibular division of Trigeminal CNV3

MASSETER: elevates mandible and protracts it; prime mover of jaw closure: Mandibular Division of Trigeminal N CNV3

MEDIAL PTERYGOID: Elevates and protracts mandible; produces side-to-side movement of mandible; Mandibular division of Trigeminal

MENTALIS: elevates and protrudes low lip while wrinkling skin of chin; facial N (CNVII)

NASALIS: Compresses bridge and depresses tip of nose elevates corner of nostrils; facial N (CNVII)

OMOHYIOD: depresses hyoid bone; fixes hyoid bone during opening of the mouth, Ansa Cervicalis N

ORBICULARIS ORIS: closes & protrudes lips & compresses lips against teeth, purses lips; facial N (CNVII)

PLATYSMA: draws down the low lip and angle of mouth, tenses skin of neck and helps depress mandible; cervical branch of facial N

POSTERIOR SCALENE: flex neck, when 1st rib is flexed, elevate 1st and 2nd ribs during forced inhalation when neck is flexed; Cervical Spinal

PROCERUS: Moves and wrinkles nose; Facial N CNVII

RISORIUS: draws corner of lip laterally; tenses lips; synergist of zygomaticus MM; facial

SALPINGOPHARYNGEUS: elevate larynx and pharynx; Vagus N (CN X) viabranches of pharyngeal plexus

STERNOHYOID: depresses hyoid; C1-C3 of ansa cervicalis

STERNOTHYROID: depresses thyroid cartilage and larynx; ansa cervicalis

STYLOHYOID: Elevates hyoid bone; Facial N CNVII

STYLOPHARYNGEUS: elevates pharynx and larynx; Glossopharyngeal N Via branches of pharyngeal plexus (CNIX)

superior innermost; branches of pharyngeal plexus (CNX Vagus N)

TEMPORALIS: Elevates and Retracts mandible; Mandibular division of Trigeminal Nerve (CNV3)

THYROHYIOD depresses hyoid bone and elevates thyroid cartilage of larynx, Hypoglossal N CNXII

ZYGOMATICUS MAJOR: draws angle of mouth up and out; facial N (CNVII)

**UNIT 5 CRANIAL NN**

1. **I Olfactory N:** Action special sensory=smell Exit cribiform plate Location receptors of olfactory epithelium (mucosa) Olfaction 1.Olfactory Epithelium: lines roof of nasal cavity, nasal septum, and medial wall of superior conchae; Olfactory Hairs: pick up air born particles

2. Olfactory bulb: olfactory N fibers synapse with mitral cells(axons of these form the olfactory tract) 3.Olfactory Tract: relays nerve impulse to olfactory cortex, hypothalamus & limbic system \*\*only sense that can reach cerebral cortex without first going through the thalamus(goes to ethmoidal centers of brain instead)

2. **II Optic N:** Action special sensory=sight Exits optic canal Enters optic disc Location retina of eye Sight later

**3. III Oculomotor N:** Action motor=mm that constrict pupil; lens of eye; raise upper eyelid; turn eye Exit sup orbital fissure Location mesencephalon, ciliary ganglion; all mm of eye EXCEPT sup oblique & lat rectus

**4. IV Trochlear N:** Action motor=sup oblique m(down & out, cheater m) Exit sup. orbital fissure Location midbrain

**5. V Trigeminal N:** Exit sup orbital fissure; Three Braches \*also supplies Dura Mater

**1.Opthalmic N:** Action: Sensory Exits: superior orbital fissure Location: Trigeminal ganglion Branches

**1. Nasociliary:** (eyeball sensory) divides I.infratrochlear N: eyelids, conjuncitiva of lower eyelid, skin of nose II.ethmoidal N: sinuses

**2. Frontal N:** supratrochlear N: skin of forehead II.supraorbital: frontal sinuses, conjunctiva of upper eyelid

**3. Lacrimal N:** Lacrimal gland, conjuctiva and skin of upper eyelid

**2. Maxillary N:** Action: Sensory Exit: Foramen rotundum Location Trigeminal ganglion Major Cutaneous Branches:

**1.Infraorbital N** Supplies cheek, lower lid, upper teeth (Infraorbital> Superior Alveolar)

**3.Mandibular N:** Action: Sensory & motor Exit: Foramen ovale Location: Pons Major Cutaneous Branches

**1. Buccal N** gingiva

**2. Inferior Alveolar N** runs through mandibular foramen; supplies mm of mastication (temporalis, masseter, med&lat Ptyergoid)

🡪mental N skin of chin & lower lip, lower teeth **3. Lingual N**: tongue, sensory

**6. VI Abducent N:** Action motor=lat rectus M(move eye lat) Exit sup orbital fissure Location pons

**7. VII Facial N:** Action special sensory= taste & motor=facial expression (superficial sphincter/dialators of orfices of head), scalp mm, salivary glands, lacrimal glands & palate Exit: Int. acoustic meatus & stylomastiod foramen Location: Pons First Branch posterior auricular-auricular mm, frontal belly of occipitofrontalis m 5 Terminal Branches (motor): Temporal, Zygomatic, Buccal(cheek), Mandibular(jaw) & Cervical (neck)

**8. VIII Vestibulocochlear N:** Action Vestibular Branch: sensory=balance Cochlear Branchsensory=hearing

Exit int. acoustic meatus Location Vestibular: vestibular ganglion Cochlear: spiral ganglion

**9. IX Glossopharyngeal N:** Action: special sensory=taste(post. 1/3 of tongue); motor=mm of pharynx (stylopharyngeus m), parotid gland Exit jugular foramen Location medulla, taste buds

**10. X Vagus N:** Action special sensory=taste motor + sensory = visceral inn= neck, thorax & abdominopelvic, smooth Exits jugular foramen Location medulla

**11. XI Spinal Accessory N** Action (motor) sternocleidomastoid & trapezius mm Exit jugular foramen Location medulla

**12. XII Hypoglossal N** Action (motor) extrinsic & intrinsic mm of tongue (all but palatoglossus M) Exit hypoglossal canal Location medulla Branches ansa cervicales (cervical plexus), lesser occipital, greater auricular, transverse cervical

**!!!!!!!!!!!SKULL STRUCTURES!!!!!!!!!!!!**

**External Structures of Skull:** 1**.Neurocranium** “brain case” case for brain & cranial meninges; calvaria (skull cap), .basicranium (cranial floor); 2.**Viscerocranium** “face case” not associated with the brain; facial skeleton: bones of orbits, nasal cavities, maxilla & mandible

**Other Skull Structure:** **Temparomandibular Joint (TMJ)** joint where mandible art. w/ braincase Nasion suture where frontal meets nasal bones Glabella area between orbits, sup to nasal bones Temporal Fossa depression; origin for temporalis MPterion H shape🡪meeting of temporal, parietal, frontal, sphenoidal🡪weak spot middle meningeal A beneath Occiput back of head (occipital/temporal/parietal)Hard Palate palatine process of max bone & palatine bone

Cranial Fossa conforms to the contours of the brain, ant(front), middle(temp), post(cerebellum). **SCALP LAYERS** (1st 3 layers = scalp proper)**1.Skin 2.CT:** thick, cutaneous NN **3.Aponeurosis= Epicranial Aponeurosis or Galea Aponeurotica**: tendinous sheet covering calvaria, frontal and occipitofrontalis mm attach here **4.Loose CT:** allows movement of scalp proper **5.Pericranium:** dense layer of connective tissue; forms external periosteum of calvaria

**AA of Face:** Superficial Temporal: **Branches**: Transverse facial **Origin:** External carotid **Distribution**: Skin of frontal and temporal areas Facial A: Branches: Inf labial, Sup labial, Lat nasal, Angular **Origin:** External carotid A **Distribution**: mm of facial expression Inferior Labial: **Origin**: Facial **Distribution:** Lower lip & chin Superior Labial: **Origin**: Facial **Distribution**: Upper lip and septum of nose Lateral Nasal: **Origin**: Facial **Distribution**: Dorsum of nose Angular: **Origin**: Facial **Distribution**: Superior cheek & lower eyelid Lingual: **Origin**: External Carotid **Distribution**: Tongue Superior Thyroid: **Origin**: External Carotid **Distribution**: Thyroid Superior Laryngeal: **Origin**: Superior Thyroid **Distribution**: Larynx Posterior Auricular: **Origin**: External carotid **Distribution**: Auricle and posterior scalp Occipital: **Origin**: External Carotid **Distribution**: Posterior Scalp Supraorbital: **Origin**: Internal Carotid🡪Ophthalmic🡪 Supraorbital **Distribution**: MM of forehead and skin Supratrochlear: **Origin**: See supraorbital **Distribution**: mm of skin of scalp Maxillary: **Origin**: External carotid **Distribution**: Chin Mental: **Origin**: External carotid **Distribution**:FacialM

**VV of Face:** Supratrochlear: scalp & forehead Supraorbital: scalp & forehead Angular: upper/lower lids **Origin**: medial angle of eye(union of supratrochlear and supraorbital VV) (All 3 flow into facial)Facial: anterior scalp, eyelids, submandibular gland, nose **Origin:** continuation of angular V Superficial Temporal: side of scalp, temporal area & external ear Retromandibular: parotid gland & massater M **Origin:** superficial temporal & maxillary. Flow: Superficial Temporal/Maxillary/Facial V all flow into Internal (mainly)/External Carotid V.

**Thyrocervical Trunk: Inferior Thyroid:** Primary visceral artery in neck **Suprascapular/Transverse Cervical:** Both supply MM on posterior side of the neck (Scapula, Trap. M, Scalene MM)

**Nerves of Superficial Neck: (Sup🡪Inf)Cross sternocleidomastoid M; All Cutaneous** **Lesser Occipital N/Greater Auricular N/Transverse Cervical:** Branches of Cervical plexus arising from loop of C2-C3;, not muscles of this region

**TRIANGLES OF NECK:**

**MM of Anterior Triangle:** (bound by mandible and sternocleidomastoid M): Suprahyoid group: above hyoid/larynx; Digastric (V,VII), Mylohyoid (V), Genohyoid (XII), Stylohyoid(VII) Infrahyoid below hyoid: Sternohyoid , Omohyoid, ,Sternothyroid, Thyrohyoid (XII) All others INN by Ansa Cervicalis

**MM of Post. Triangle:** (bound by trapezius M and sternocleidomastoid M) MM in both triangles: OMOHYOID

**Superficial MM of Lat. Neck:** platysma, sternocleidomastoid & trapezius

**Order of Vessels that cross the Sternocleidomastoid M:**1.external jugular V 2.lesser occipital N 3.greater auricular N 4.transverse cervical N \*\*3 & 4 are branches of the cervical plexus

**Salivary Glands:** Parotid: largest Duct: pierces buccinator mm, empties into oral cavity (Glossopharyngeal N) Subligual: lies in floor of mouth btwn mandible & genioglossus M Duct: floor of mouth (Facial N) Submandibular: inferior to body of mandible Duct: near lingual frenulum; allows “gleeking” (Facial N).

**Mandible & Teeth:** NN inf & sup alveolar NN (sensory) ; 32 teeth; deciduous (milk teeth: premolars, incisors & canines); permanent (molars); Tooth Formula 2,1,2,3 = incisors, canines, premolars, molars Cusps: points on teeth.

!!!Brain Structure!!! **Tracts**: white matter. 3 types **1.Projection**: btwn brain and spinal cord. **2.Commissural**: communication BTWN hemis (corpus callosum, ant/post commissures). **3.Association:** communication W/IN hemis.

Cortex (surrounds white) and Cerebral Nuclei (pockets in white) are gray matter!.

**Embryology:** CNS 1st hollow tube w/ neurocoel. Week 4: cephalic portion of tube enlarges to form 3 Primary Br Ves

**.1.Prosencephalon (Forebrain):**

1.**Telencephalon:Cerebral** **lobes**:conscious thought, intellectual function, memory, storage, processing A.**Frontal** **lobe**: primary motor cortex – voluntary control of skeletal mm–personality, decision making, verbal comm,B. **Parietal**: Sensory; conscious perception of touch, pressure, vibration, pain, temp, taste C.**Occipital**: Sensory; visual cortex, conscious perception of visual stimuli D.**Temporal** **lobe**: Sensory; 1.Auditory cortex: *conscious* perception of aud stimuli 2.Olfactory cortex: *conscious* perception of olf stimuli . **Insula**Sensory; gustation cortex (taste) **Homunclus:** shows amount cortex devoted to sensory/motor. **Association Areas:** runs interference btwn sens/motor output, Integrates sens info w/ stored memories for interpret **2.Diencephalon:** **Epithalamus**: roof of 3rd vent; contains pineal gland; secretes melatonin; Circadian rhythm **Thalamus**: grey matter on either side of 3rd vent walls. Relay and processing center for all sensory info to cerebrum (except smell) **Hypothalamus**:= control/regulates activities thru hormone release (body temp, hunger, sex, sleeping), **Pituitary** **Gland**: endocrine, **Releases** **Hormones**: GH, TSH, ADH. **Cerebral Nuclei:** =basal neucli, gray matter. Propreioception. **Lentiform Nucleus**: putamen & globis pallidus

**2.Mesencephalon (Midbrain)/MICKEY** processes visual /auditory stimuli and generates responsive reflexes, Subconcious **Corpora** **quadrigemina**: two pairs of sensory nuclei; survival instincts/responses **1.Sup** **Colliculus**: process **visual** info, **2.Inf** **Colliculus**: processes **auditory** info, **Red** **Nucleus**: fine motor control (posture),**Substantia** **Nigra**: regulates motor output of cerebral nuclei, produces dopamine (inhibits involuntary m movement); Parkinson’s is too little dopamine, **Cerebral** **Peduncle**: anchor cerebrum to brainstem; carry info btwn cerebrum and brain stem, **Cerebral Aquaduct**: connects 3rd and 4th ventricle; mouth

**3.Rhombencephalon (Hindbrain)**

**1.Metencephalon:** **Pons** : regs rate & depth of breathing (works w medulla & its resp center) relays sensory info to thalamus, cerebellum, **Cerebellum**: vermis unites hemispheres; arbor vitae—white matter; folia—gray; **Functions**: receives info from cerebrum, ear, eye, spinal cord; outputs info to cerebrum and skeletal mm; stores long-term fine-tuning(ex mm memory)– monitors all proprioceptive, visual, tactile, balance, and auditory sensations received by brain and makes adjustments **2.Myencephalon:**Medulla Oblongata: relays info to thalamus and other brain centers; regs resp rate, bld pressure, heart rate (most primal part of brain; *subconscious*);**Olive**: relay ascending info to cerebellum. **Pyramid**: house motor projection tracts. Crossing over of info here, Ventricles: secretions (CSF) from choroids plexus of ventricles fill these spaces **Limbic System:** One of the centers of emotion and learning - functional group, not anatomical one – all structures bilat. paired– olfaction goes directly here Components: Cingulate Gyrus (focus on emotionally imprt events), Hippocampus(long-term mem store), Amygdala(fear,stores emotional memory) Most limbic system structures have centers for both gratification and aversion. **Fornix**: connects hippo w. other limbic structure. **Olfactory Structures:** odors connected w/ memories. Smell goes to long term storage in brain NOT the thalamus

**CRANIAL MENINGES** (same as in spinal cord)

Dura Mater: protects brain, supports vessels and forms venous sinuses; dense fibrous membrane Outer Layer: adheres to surface of skull, bilayered 1.External: periosteal layer 2.Internal: meningeal layer Arachnoid Mater: delicate intermediate layer; arachnoid trabeculae: weblike mass that bridges subarachnoid space (CSF filled) & “suspends” brain Pia Mater: delicate, highly vascularized membrane; innermost layer Arachnoid Granulations: extensions of arachnoid that protrude though meningeal layer of dura into the venous sinuses🡪allows transfer of CSF to dural venous sinuses

Meningeal Spaces A. Epidural Space=dura/skull interface –“potential” space –occurs between cranial bones & external perosteal layer of dura B. Subdural Space=dura/arachnoid junction –“potential space” (epidural/subdural can become real space from trama) C. Subarachnoid Space: -actual space occurs btwn arachnoid & pia contains CSF, trabecular cells, AA & VV Epidural Hematoma: btwn skull and dura commonly caused by rupture of **meningeal A** Subdural Hematoma: commonly result of rupture to cerebral V (Shaken-baby Syndrome)

Vessels & NN of Dura Mater: **AA: middle meningeal A**: branch of **maxillary**🡪runs in epidural space beneth pterion Both supply dura/meninges **VV: middle meningeal V;** accompanies **middle meningeal A** NN: mainly from branches of **trigeminal NN**

Dural Infoldings: (or dural reflections) formed by internal meningeal layer of dura Functions: support & separate different regions of brain **Falx Cerebri**: largest; in longitudinal fissure. **Tentorium cerebelli:** separates occipital lobe from cerebellum. **Falx Cerebelli:** partially separates cerebellar hemispheres. **Sellar diaphragm**: suspends btwn clinoid process🡪forms roof over hypophyseal fossa (covers pituitary gland) 🡪has aperture for passage of infundibulum

**Dural Venous Sinuses:** spaces btwn periosteal & meningeal dura. All blood from brain drains thru sinuses🡪 IJV. (See CFS flow)

**AA of Brain/Head/Neck**subclavian🡪vertebral(supplies deep neck mm)🡪post inf cerebellar & basilar🡪(ant inf cerebellar & pontine & sup cerebellar)& post cerebral(ICA)🡪post comm.---int carotid( supplies middle, ant brain, eye-via ophthalmic A,enters skull thru carotid canal.) **Circle of Willis or Cerebral Arterial Circle:** important anastmosis btwn internal carotid & vertebral🡪post cerebral, post communicating, ant cerebral, ant communicating, internal carotid **VV Drainage**cerebral VV🡪dural venous sinuses🡪internal jugular V

**External Carotid:** Supplies neck/face, branch out of skull Maxilary A branches: 1)**Mandibular part:**middle meningeal (dura, calveria), inf alveolar (low teeth), mental 2)**Pterigoid part**: masseteric, buccal(gums) 3) **pterygopalatine part:** descend palatine (🡪 great palatine), (hard plate), sphenopalatine (nasal septum, paranasal sinus). Infraorbital ( through infraorbital foramen).

MM of Deep Neck: ant, mid, & post scalenes: O=C2-5 I=ribs A= lateral flexion-unilat, flexion of neck- bilat, elevate ribs during breathing

Visera of Neck

1. ENDOCRINE: Thyroid Gland: bilobed; produces Thyroid Hormone🡪controls rate of metabolism **Calcitoin**🡪reduces bld Ca levels ARTERIES sup thyroid (from ext carotid) & inf thyroid (from thyrocervical trunk) VEINS sup/middle thyroid🡪 IJV; inferior thyroid 🡪 BCV Parathyroid🡪( produces PTH) increases bld Ca levels

2. RESPIRATORY: (larynx, trachea, pharynx) Laryngeal skeleton: 9 cartilages joined by ligaments and membranes “voice box” SINGLE Cartilages: 1. Thyroid: largest laryngeal prominence=Adams Apple, does not go all the way around; 2. Cricoid: goes all the way around, larger in back; 3. Epiglottis PAIRED: 1. Arytenoid-each has a vocal process that extends anteriorly and provides posterior attachment for the vocal ligament; 2. Corniculate: attachment for aryepiglottic fold; 3. Cuneiform: lies within aryepiglottic fold between arytenoid and epiglottis

**LARYNGEAL CAVITY DIVIDED INTO 3 PARTS:** vestibule, ventricle, and infraglottic cavity (from vocal cords to inf border of cricoid cartilage). Aryepiglottic folds: house corniculate cartilage and cuneiform cart, support for soft tissue. Vestibular folds: false voc cords, prevent objects from entering glottis; Vocal folds: true voc cords, source of sound; each contain vocal ligament and vocalis M: run from arytenoid cartalige to thyroid; Glottis: vocal apparatus of larynx, comprises voc cords and processes + rima glottidis; Rima Glottidis: aperture (opening) b/n vocal cords.

**MUSCLES OF LARYNX:** two groups move larynx as a whole. 1. Extrinsic: (move larynx as a whole) **Infrahyoid mm**: depressors of hyoid and larynx. **Suprahyoid**: elevators of hyoid and larynx. 2. Intrinsic: move laryngeal parts: **Lat cricoarytenoid** adduction of VC; **Post cricoarytenoid** abduction of VC; altering length and tension of voc cords. All .but cricothyroid (ext. laryngeal n from vegas) are innervated by recurrent laryngeal from Vagus

3. ALIMENTARY:(Pharynx + Esophagus) Pharynx = common passageway, nose, mouth and throat; internal nares to entrance of larynx and esoph; shared by digestive and respiratory systems. Three Parts: NASO – respiratory only; between soft palate and nasal cavity, pharyrngeal tonsil (adenoids). ORO – respiratory and digestive; between soft palate and base of tongue at hyoid bone, palatine and lingual tonsils. LARYNGO – digestive; between hyoid bone & esophageal orfice, continuous w/ esophagus. .

LARYNX SEPARATES RESPIRATORY FROM MM OF PHARYNX:

1. External: constrictors – run circumferentially, sup/midd/inf, when you swallow they constrict 2. Internal: stylopharyngeus, salpinopharyngeus, and palatopharyngeus, run longitudinally, elevates(shortens and widens) pharyns and larynx during swallowing and speaking. Innervation: branches of VAGUS except stylopharyngeus (CN IX)

**DEEP FACE**: NASAL CAVITY: area btw nasal vestibule and nasopharynx.(where concha are) Fxn: filtering, warm and moisten air. Respiratory (inf 2/3), Olfactory (sup 1/3).

Floors: hard Palate, eat/breathe at same time. External Nares: opening vestibule. Internal Nares: opening to nasopharynx. **Septum:** Divides cavity (ethmoid/vomer bones, spetal cartilage). **Concha**: divide cavity into passage to create turbulance for warm/moist/smell.

Paranasal Sinus: lighten skull, create resonance for sound & voice; air filled extensions of repiratory part of nasal cavity. Nasolacrimal Duct: communicate w/ inf. Meatus, drainage of excess tears (when you cry= runny nose)

ORAL CAVITY: Bound by cheeks/roof/floor **Roof:** hard and soft palates. **Floor**: tongue. **Oral Vestibule:** between lips and teeth

Upper Lip: **sup labial A (🡨facial)** & infraorbital N; Lower Lip: **inferior labial A (🡨facial) mental A** & mental N.

TWO ARCHES SEPARATE ORAL CAVITY FROM OROPHARYNX: **palatoglossal** and **palatopharyngeal**; palatine tonsils in between

Tongue MM: Extrinsic MM: Genioglossus🡪(XII) D,P Hyoglossus🡪 (XII) D Styloglossus🡪 (XII) E,R Palatoglossus🡪 (X)(All elevate/dress; protrude/retract) Intrinsic MM: Superior Longitudinal/Inferior Longitudinal (curl/shorten), Transverse (narrow,elongate) Vertical(Flatten,broaden)**:**  **AA:** Lingual A branches.

SENSORY SYSTEM:

**1.General:** internal & external, widely distributed, pain, touch, temp, vibration and proprioception.

**2.Special:** localized, specialized, usually a single function. **Sensory Receptors** transform environment energies-nerve impulses carried to CNS for processing. **Interpretations**: taste color, are perceptions of brain. **Receptor Specificity**: Each one has a characteristic sensitivity. **Receptor field:** Size of field covered by one neuron General Sensory Organs: 1. Unencapsulated sensory rec.: lack specialized associations at terminal ends. **Free nerve endings**: most abundant, warm, cold, and pain. **Tactile Discs:** light touch, pressure. **Hair Receptors**: monitor movement of hair; adapt quickly (clothing).2.Encapsulated sensory rec.: terminal end enclosed is specialized structure – all in skin Meissner’s (Tactile) corpuscle:responds to light touch,low frequency vibration (fingertips, eyelids, lips, ex genetalia, tongue) Ruffini corpuscle: deep pressure, responds to stretching / distortion of dermis (joint capsules, dermis) Pacinian (Lamellated) corpuscles: heavy pressure, high frequency vibration (joint capsule, dermis, ex genetalia) Tonic receptors: always on (photoreceptors / balance) Phasic receptors: short periods of activation, usually adapt – reduction in sensitivity with continued stimuli (smell)

Special Sensory Organs:

**Sight: Accessory Eye Structures:** Conjunctiva – lines ext/ant surface of eye; moistens eye, supplies sclera Lacrimal Glands – produces tears,

lubricates eye so no friction of eyelid, cleans and moistens surface, helps prevent bacterial infections.LAC GLANDS🡪TEARS SWEPT

ACROSS EYE🡪LAC CANALS🡪LAC SAC🡪 NASOLACRIMAL DUCT🡪INFERIOR MEATUS Eye MM: Sup. Rectus: up (IIV)

Inf. Rectus: down(IIV) Med. Rectus: in(IIV) Lat. Rectus: out (Abducens) Sup. Obl: inf/lat “cheater”(IV) Inf. Obl: sup/lat “thinker” (IIV)

**3 CHAMBERS** 1.Anterior – space between cornea and iris / pupil 2.Post. – space between iris / pupil and lens and ciliary body **Ant and Post filled with Aqueous Humor** 3.Vitreous – post. to lens – filled with vitreous humor – helps maintain shape of eye – supports post. surface of lens **Outer Layer** Sclera: white of eyes Covers most of ocular surface Muscles insert here Cornea: avascular, transparent anterior part – sensitive to touch, continuous with sclera. Outer – avascular gets nutrients and O2 from tears. Inner – receives oxygen and nutrients from aqueous humor **Middle layer** --Iris: contains blood vessels, pigment cells, smooth mm Thin diaphragm with central aperture = pupil for transmitting light. Two layers of smooth muscle which enlarge / reduce pupil Pigment: density determines eye color--Choroid: largest part of middle layer Lies btwn retina and sclera layers Delivers oxygen and nutrients to outer portion of retina Ends anteriorly in ciliary body--Ciliary body: begins at junction between cornea and sclera and extends to ora serrata (connects choroid to iris); Suspensory ligaments hold lens in place Ciliary processus – secrete aqueous humor (provides nutrients for cornea and lens – both are avascular). **Inner Layer** Retina: **Inner**=nueral layer, light/photo receptive, Orra Serrata: ant. Termination of nueral layer. **Outer**=Pigmented layer that reduces light scattering in eye. Rods= highly sensitive, see in dim light, located on retina Cones: color vision. Light entering eye focused by lens onto photoreceptors.

**Macula Lutea**: all cones- acute vision. **Fovea Centralis**: center of macula, sharpest vision. **Optic Disc**: “blind spot” where optic N enters

**TASTE!** Gustation: tongue surface **Lingual papillae:** (3) houses taste receptor cells of tongue 1.Vallate papillae: large / flat topped, back of tongue, taste receptors present 2.Fungiform papillae: mushroom shaped – taste receptors present 3.Folliate Papillae small lateral folds at tip, poorly dev. In humans, taste receptors present **Filiform papillae** – MOST ABUNDENT long and sensitive to touch – few receptors present

Five taste sensations –sweet, sour, bitter, salty. umami (meat/salty)

Innervation: Sensory- **Facial N:** taste, ant 2/3. **Glossopharyngeal N**: taste post 1/3. **\*Vagus N**: taste, palate and base of tongue. **Lingual N**: general senory (temp, pain). Motor- Hypoglosseal and \*Vagus (palatoglosseus m)

Olfaction sense of smell with three main components Olfactory epithelium – lines roof of nasal cavity, nasal septum, and med. wall of sup. Conchae. Olfactory receptor cells here. **Olfactory Hairs**: pick up air borne particles. Olfactory bulb: Olfactory N fibers: attached to olfactory cells. Go thru cribiform plate, synapse with Mitral cells; Mitral cells – axons of these cells form olfactory tract Olfactory tract: relays N impulse to olfactory cortex, hypothalamus, limbic system(long mem) \*\*Only sensations that reach cerebral cortex w/out synapsing to thalamus

**TIA or Transient Ischemic Attacks:**refer to neurological symptoms that result from ischemia(deficent bld supply); symptoms: dizzy, faint, tingling limbs (only lasts a few min)

UNIT 1: MM aiding in resp secondarily.(serratus post sup/inf, levator costorum) **True/Intrinsic MM:**1.Erector Spinae: (med to lat) Spinalis thoracis, cervicis & capitis🡪longisimus thoracis, cervicis & captitis🡪iliocostalis lumborum, thoracis, cervicis 2.Transversospinalis: semispinalis, multifidis, rotators Rotator Cuff: supraspinatus, infraspinatus, teres minor, subscapularis Suboccipital Triangle: **Atlanto-Occipital** (“yes”) rectus capitus posterior major/minor, obliquous capitus sup **Atlantoaxial**(“no”) rectus captius post major, oblique capitus inf NN/AA- **Greater Occip N**(Semispinalis capitis m)**, Suboccipital N**(mm in suboccip region)**, Occip A**(supplies suboccip). Gluteal Region Vessels: **Sup Gluteal A**(above piriformis) 1.**superficial branch:** supplies gluteus maximus 2**.deep branch:** supplies medius, minimus & tensor fasciae latae **Inferior Gluteal** **A** (below piriformis) supply gluteus maximus **Branches:** obturator inturnous m, quadradis femoris m **Gluteal VV:** form alternate venous return from the lower limb if femoral vein becomes obstructed Sciatic N 🡪tibial & common fibular Sup Glut N🡪Gluteus med, min, tensor fasciae latae Inf Glut N🡪glut max Lumbar Plexus: lower abdomen, pelvis, thigh, genitalia Sacral Plexus: thigh, leg, foot 31 pair SPN(5lumb, 5sac, 12thor, 8cerv, 1cocc) Denticulate Ligaments:paired extensions of pia mater🡪 connected to dura mater to prevent lateral movement of spinal cord **Gray Matter:**Anterior Horn=cell bodies of somatic motor neurons innervate skeletal mm Posterior Horn=interneurons & sensory axons **White Matter:**Fasciculi(tract)=bundle of axons with shared functions conveys sensory data or motor commands, makes up Funiculi(column) (post,ant,lat columns of axons) **Information Carried in Spinal Cord: Dorsal Root** (afferent) connects to post horn of gray mater carries sensory info fibers to spinal cord **Ventral Root (efferent)** arises from ant horn of grey mater carries motor efferent fibers form spinal cord to periphery Pathway: vertebral body🡪epidural space🡪dura matter🡪sub dural🡪arachnoid mater🡪subarachnoid space (filled w/ CSF)🡪pia mater🡪white mater🡪gray mater Ascending Tracts=sensory only; cross at medulla or spinal cord **Structures:** fasiculus gracilis, fasciulus cuneatus, spinothalamic & spinocerebellar tracts Descending Tracts **1. Direct:** direct voluntary movement of skeletal m **Structures**: corticospinalis (lateral & ventral) tracts 2. Indirect: autonomic movement; modify posture; balance **Structures:** rubrospinal, vestibulospinal, tectospinal & olivospinal tracts Functions of Skin: synthesis and secretion (keratin heals wounds), UV light, vit D Sweat Glands: **Apocrine:**hormone reg sweat **Merocrine:** Normal sweat Epidermis Layers: 1.**Stratum Corneum**: small in thin skin, flattened, dead keratinocytes; H2O resistant; dry, prevents microorganism growth 2**.Stratum Lucidum**: (in thick skin) thin, translucent layer; flattened; densely packed w/ keratin 3.**Stratum Granulosum**: 3-5 layers of flat keratinocytes that produce protein keratin 4.**Stratum Spinosum:** layers of keratinocytes 5.**Stratum Basale:** attached to basement memb., stem differenciate into keratinoc melanocytes produce melanin; merkel cells where no hair is present🡪respond to tactile stimulation(mechanoreceptors) Dermis Layers: 1.**Superficial Papillary Layer**: loose CT, capillaries, sensory neurons 2.**Reticular Layer**: dense interwoven CT bundles of collagen fibers (provide strength) & elastic fibers (provide stretch) Epidermal ridges=fingerprints Skin Layers (out to in): epidermis🡪dermis🡪hypodermis🡪 deep fascia🡪subscerus membrane fascia🡪serous membrane Types of Ossification: 1.**Intramembranous**: mesenchyme🡪loose embryonic CT differentiate directly into bone🡪roofing bones of skull,dentary,clavicle,sesemoids 2.**Endochondral:** mesenchyme 1st forms into cartilage before bone🡪limb bones, vertebrae, and everything else Long Bone Growth: Diaphysis=shaft or middle; **Epiphysis**=ends of long bones; **Metaphysis**=where flairing occurs before end; **Epiphyseal plate**=growth plate or cartilaginous plates that lie between the epiphysis & diaphysis UNIT 2: Basic M shapes:

**Parallel**,**Circular**, **Convergent**: triangular,**Pennate**: short mm fibers in relation to tendon, **Fusiform**: nearly parallel Injury to Nerves in Brachial Plexus: **Axillary:** compressed within axilla or damaged if surgical neck of humerus is broken🡪can’t abduct b/c deltoid is paralyzed **Radial:** humeral shaft fractures🡪parylasis of extensor mm, can’t extend wrist **Posterior Cord Injury:** pressure on axilla(crutches)**Median**: carpal tunnel or deep cut🡪ape hand **Ulnar**: fractures, dislocations of elbow🡪paralysis of intrinsic hand mm **Sup Trunk:** excessive separation of neck & shoulders **Inf Trunk**:excessive abduction (pull babies arm to hard, hanging off cliff)🡪ulnar N Quadrangular Space: **Bony Border:** surgical neck of humerous **MM Border:** teres minor, subscapular, tricep, teres major **Going Through**: axillary N, post humeral circumflex A Brachial Plexus: ventral rami (C5-T1), trunks(upper,mid,low), divisions(ant-flex.post-extend.), cords(med,lat,post) **Superior:** long thoracic, suprascapular **Lateral**: lateral pectoral, musculocutaneous, **Posterior**: uppersubscapular, thoracodosal, lower subscapular, axillary, radial **Medial**: ulnar, medial brac/antebrac cutaneous, medial pectoral, median Axillary V IN: cephalic, brachial, basilic VV **Femoral Triangle** **Borders**: inguinal lig, adductor longus, sartoreous **Contents**: Femoral N, A & V, (A&V in femoral sheath to avoid obstruction) Popliteal Fossa **Borders**: Biceps femoris m, semitendinosus m, gastrocnemius m **Contents**: tibial & common fibular NN, popliteal A & V, small saphenous V Cubital Fossa: contents🡪median N, radial N & A, ulnar A Tendon of Extensor Digitorum M: sends tendons to each finger **Extensor** **Expansions**: extensor hoods; formed by aponeurotic expansions of ext. digitorum tendons, lumbricles, interosseous tendons & CT **Extensor/Flexor Retinacula:** strong fibrous bonds that cross wrists/ankles on flex/extend side. Most tendons are enclosed within synovial sheath Hypothenar: base of 5th digit, Ulnar N Thenar: Median N, thenar eminence raised region between wrist/thumb Hand:**ulnar A**(🡪deep branch of ulnar A🡪 deep plamar arch)🡪superficial arch **radial A(**🡪superficial branch of radial A🡪superficial arch)🡪deep palmar arch Arteries of Foot **Dorsal:** ant tibial A🡪dorsal pedis A(🡪deep plantar arch) 🡪arcurate arch(dorsal arch **Palantar:** post tibial🡪lat & med plantar🡪 deep plantar arch \*\***Anastomosis** deep plantar arch and plantar arch Joints: **Fibrous**: **nonmoveable**=teeth (gomphosis), skull bones (suture); **some** **movement**=syndesmosis (interosseous memb+bone)🡪radius/ulnar & tibia/fibular **Cartilaginous:** **primary**: Synchondrosis-.hyline cartilage (ex. epiphyseal plate, ribs joints), immobile **secondary**: Symphisis-fibrocartilage(ex. intervertebral disc, pubic symphysis) slightly mobile Synovial Joints **Attributes:Articular** **Capsule**: fibrous capsule lined with synovial membrane **Articular** **Cartilages**: covers articular surface of bone (prevent friction) **Synovial** **Membrane**: covers internal structures not covered by cartilage & produces 🡪**Synovial** **Fluid**: lubricates joint, nourishes cartilage, shock absorber **Bursae** function to reduce friction/absorb shock🡪found between bone/mm, tendon/bone, mm/mm. **Tendon Sheaths** enlongated bursa around tendons **6 Types:** 1.**Ball** **and** **Socket**: hip and shoulder; (flex, extend, abd, add, lat/med rot, circum). 2.**Hinge**: knee, wrist, interphalangeal, elbow(ulnar & humerous) (flex/ext) 3.**Gliding** or **Planar**: acromialclavicular, carpal/tarsal, sup/inf articular facet of vertebrae, Triquitral and Hamate (permits gliding in 1 plane) 4.**Pivot**: (rotation) dens of axis & radius/ulnar (pron/supination) **5.Saddle:** (biaxial) carpometacarpal, trapezoid & 1st metacarpal (flex, ext, abd, add) 6.**Condyloid**: MCP and MTP joints “egg in spoon” (flex/ext,add/abd) Glenohumeral Joint **Bones:** clavicle and scapula(acromium and coracoid process) **Coracoacromial Arch:** lig btwn coracoid and acromion process🡪prvents humerus from pushing out of glenohumeral joint **Facts:** most mobile; shallow glenoid cavity so glenoid labum(ring of cartilage) helps to deepen; tons of bursae sacs **Stabalizers:** Coracoacromial: prevents shoulder dislocation, corocohumeral lig; sup, mid, inf glenohumeral; rotator cuff mm; biceps brachii long head tendon Knee Ligaments **1.Extrasapsular:** LCL, MCL, patellar lig, popliteal ligs **2.Intra-articular:** **ACL**: strong; arises anterior intercondylar area of tibia; prevents hyperextension , so femur doesn’t slide post. **PCL**: weak; arises at post intercondylar area of tibia; prevents hyperflexion, so femur doesn’t slide anteriorly **Menisci**: plates of fibrocartilage; shock absorbers; **external** **margins**🡪thick, where attached to fibrous capsule of knee **interior** **margins**: thin, not attached **Structures:** Medial Meniscus=C-shaped;, attached to MCL **Lateral** **Meniscus**=oval shaped(more complete anteriorly; **Transverse** **Lig**=joins ant edges of meniscus **Unhappy triad:** MCL, ACL, Med Meniscus Ankle Joint: **Articulations:** tibo-talus (weight bearing) & fibula-talus(both enclosed within one synovial joint) \*lateral and mecial malleoli surround talus on both sides **Ankle Ligaments:** 1.**Deltoid** **Ligament**🡪**incredibly strong** prevents over eversion(tibiocalcaneal, tibionavicular, post. tibiotalar) 2.**Ant** & **Post** **tibiofibular** **ligs** (lateral) 3.**Lateral** **Ligament**: post talofibular lig; ant talofibular lig; calcaneofibular lig. Lig not highly vascularized, long healing. Syndesmodic sprain: high ankle, interosseous membrane sprained. Radioulnar Joints (allow **pronation** and **supination**) **1. Hinge:** (elbow) **Ulnar** **Collateral** **Lig**: btwn med epicondyl and ulna **Radial** **Collateral** **Lig**: at lateral epicondyl🡪attaches to annular lig(not radius) **Function**: independent rotation of radius **2.Pivot:(**Radius/ulna) convex lower end of ulna; articulates w/ ulnar notch of radius

UNIT 3: **Thoracic Wall:** 12 ribs (1-7 T, 8-10 F, 11-12 Float). Thoracic Apertures:- Sup Thoracic Ap: thoracic inlet, open at top of ribs

Inf Thoracic Ap: thoracic outlet, closed off by diaphragm **Primary breathing MM** intercostals, transverse thoracics, subcostals **Secondary** subclavius, pec minor, serratus ant, levator costarum.. **Inhale:** Ext intercostal, Levator Costarum. **Exhale**: int intercostal, inner intercostal, transversus thoracis, subcostal, subclavius, serratus ant, pec minor. **Intercostal NN** terminate anteriorly in ant cutaneous N, 11 pairs. **Origin:** Ventral rami T1-12; **collateral branches:** supply intercostals mm; **lat/ant cutaneous branches**: go to skin; **rami communicates:** connect intercostals NN to ipsilateral sympathetic trunk **NN of Abdominal Wall**: Intercostal NN: continuation of .lower intercostal N), Subcostal N: Ventral Rami (T12); Iliohyposgastric N: Ventral rami (L1), Ilioinguinal N: Ventral Rami (L1) **AA of Abdominal Wall** **external iliac**🡪inf epigastric & deep circumflex iliac A; **femoral A**🡪superficial epigastric & superficial circumflex iliac A; .**Int thoracic**🡪sup epigastric A \*\*anastmose inf & sup epigastric**Abdominal Regions: Horizontal:** Transpyloric and Transtubercular **Vertical:** rt/lf lateral **Mediastinum**: central compartment, does not contain lungs. **Sup Med**: sternal angle, from aortic arch up. **Inf Med**:below .plane of sternal angle above diaphragm, **Ant:** lymph, fat (sternum to pericardium). **Middle**: Heart, **Post**: behind heart. **AA of Pericardium** mainly paracardiacophrenic (off int thor A); also musculophrenic and coronary **Pericardium:** **Fibrous**: outer layer, Superiorly: fused with .tunica externa of great vessels enter/leaving heart.Inferiorly fused w/ central tendon of diaphram **Serous:** Deep to fibrous; 1. **Parietal**: Lines .inner surface of fibrous pericardia, 2.**Visceral**: covers heart, epicardium. **Pericardial Cavity** = potential space btwn parietal and visceral .layers. **NN of Pericardium** phrenic, vagus, sympathetic trunk. **Internal <3 Structures: Fibrous Skeleton:** seperates atria from vents so electrical impulse doesn’t spread to all 4 chambers at once **Both Atria**: Pectinate, **Rt. Atrium:** Crista Terminalis **Both Vent**: Trabeculae carnae, Papillary M, Chordae Tendinae. **R Vent:** moderator band, conus arteriosus **Lf. Vent:** aortic vestibule SA Node: posterior R atrium near SVC entrance, initiates contract of cardiac MM, pacemaker. AV Node: R Atrium floor, near coronary sinus opening, delays action potential. **Cardiac Cycle:** **Contract**: Systole, **Relax**: Diastole. Steps: 1. **Atrial Systole**: atria contract, add blood to vent; 2. **Atrial D**: atria relax, vents contract. 3.**Vent S**: vent contract close AV valve, semilunar open blood ejected. 4. **Vent D (early):** vent relax, pressure drops, bld flows toward ventricles forcing semilunar closed, bld enters relaxed atria. 5. **Vent D(late)**: all chambers relaxed, blood enters vents passively.

**Fetal Circulation:** 1**.two umbilical AA**=medial umbilical lig; carry bld away from fetus **2.one umbilical V**=round lig of liver; carries bld to .fetus **3. ductus venosus**=lig venosum; bypass liver to heart **4.foramen ovale=**fossa ovalis; bypass lung straight to heart **5.ductus arteriosus** =ligamentum arteriosum; bypass lungs go straight to heart. Pleurae: Serous membrane covering lungs forms pleural cavity. Parietal Pleura: .lines pulmonary cavity--Costal pleura, Mediastinal Pleura, Diaphragmatic pleura, Cervical pleura. **Bronchial Tree** **Order:** Primary .bronchi🡪secondary bronchi(lobar bronchi)🡪tertiary bronchi(segmental bronchi, supply bronchopulmonary segements: structural units of lungs, supplied independently)🡪terminal bronchioles🡪respiratory bronchioles🡪alveolar ducts🡪alveolar sacs(contain alveoli=surrounded by capillaries) **Bronchiopulmonary Segments:** structural unit of lung; segments separated by CT septa; each supplied independently by own tertiary bronchus, aa & vv **Diaphragm:** primary breathing mm, main control of .breathing and thoracic volume. 1.Peripheral M: arises at xiphoid process, lower ribs, lumb verts; 2. Central tendon: .insertion for peripheram MM of diaphragm L/R Crura. Crura: R crus: L1-3/4. L Crus: L1-2/3. **Median Arcuate Lig**: Joins L/R Crura forms opening for Aorta (aortic hiatus), IVC(Caval Foramen, true hole),Esophagus (Esophogeal hiatus). **NN of Lungs** ***Visceral Pleura:*** NN from pulmonary plexus (Vagus) **Pulmonary Plexuses Parasympathetic**: from vagus N; **Sympathetic**: from sympathetic trunk **Parietal Pleura:** **Phrenic** **N**: innervates central part of diaphragmatic pleura and mediastinal pleura **Intercostal N:** supplies costal pleura & peripheral part of diaphragmatic pleura

UNIT 4: **Peritoneum** **Serous memb**: produces peritoneal fluid.**Mesenteries**: folds of visceral peritoneum**Lesser Omentum:** gastrohepatic/heptatoduodenal Paritoneal Folds: **Lat Umb:** from inf epig AA/VV **Med Umb**: from med umb lig/umb AA in fetus **Median Umb**: median umb lig/ urachus in fetus **Sm Int Jejunum:** chem digestion/ nutrient absorption**Pancreas** exocrine: digestive, endocrine: hormone Hepatopancreatic ampulla: bile & pancreatic ducts merge & enter duodenal wall Duodenal Papilla: regulates bile entering duodenum **Adrenal** **cotex**: corticosteroids, **medulla**: epin/norepin**NN of Stomach:** Para:(ant/post) vagal trunks; thru esophageal hiatus; contrib. to celiac plex Sym: greater splanchnic; contrib. to celiac plexus **Sm Int NN:** Para: sup mesenteric plex (vagus via vagal trunks) Sym: reach sup mes plexus via 3 splanchinic NN **Lg IntNN**: Para: vagal fibers reach trans colon; inf mes plex(from pelvic splanch N) Sym: from inf mes plex, lumbar splanch N **NN of Post Ab Wall** subcostal, lumbar plexus=iliohypogastric, ilioinguinal, genitofemoral, lat fem cutaneous, femoral, obturator **Pelvic cavity:** Sup/inf pelv aperture, greater (false), .lesser (true) **Lumbosacral joints**: 1.intervertebral=btwn L5& S1 2.facet joint=btwn articular processes of same verts Iliolumbar lig unites the ilia & L5 **Sacrococcygeal joints** ant & post sacrococcygeal ligs=reinforce joint**Sacroiliac Joint** .btwn auricle surface of sacrum & ilium, limited movement **1.ant & post** **sacroiliac lig 2.interosseus sacroiliac lig** Sacrotuberous Lig: ishiotuberosity Sacrospinous Lig: ishiospine (both limited movement) **Pelvic Walls & Floor**: 1stLayer🡪**1**.**Ischiocavernosus**= maintains erection **2.Bulbospongiosus**=expels remaining urine, aids in erection & ejaculation 2nd Layer:**deep trans perineal m**,**external anal sphincter** 3rd Layer **Pelvic Diaphragm**=**levator ani** + **coccygeus m** **Levator Ani:** pubococcygeus, puborectalis, iliococcygeus **NN Pelvic Cavity** Pelvis=sacral & coccygeal; lumbosacral trunk; sacral plexus **1.**sciatic N(tibial & common fibular) **2**.pudendal(main N of perineum & main sensory N of ext genitalia; sup & inf gluteal N **Inguinal Canal** superficial ring: external ring/exit deep ring: internal ring Anterior Wall=aponeurosis of ext oblique m Post Wall=trans fascia Roof=int oblique & trans ab m Floor=inguinal lig **Descent of Testis**3 month: testes migrate to pelvic region 7 month: testes lie close to deep ing ring🡪days later pass thru .ing canal 8 month: testes enter scrotum Gubernaculum: cord of CT; at 3 month hormones stimulate contraction pulling down =scrotal lig Processes Vaginalis: outpouching of peritoneum; accompanies gubernaculum; degenerates=tunica vaginals Spermatic Cord=ductus deferens(muscular tube); testicular A(supplies testies and epidydimis); pampiniform .plexus(surrounds testicular A); genital branch of genitofemoral N(supplies cremaster m);Layers:ext sperm fasc(ext obliq apo), crem M(int obliq fasc/M), int sperm fasc(trans fasc) Prostate: 20-30% sem fluid; colorless fluid, rich in enzymes; dissolves mucous, seminalplasmin-kills bacteria Sem Ves: 60% sem fluid, rich in proteins/sugars Cowper: neutralizes acids, provides lubrication **Scrotum** vessels: ant & post scrotal AA(from branch of pudendalA) NN:genitofemoral & scrotal **Descent of Ovaries** develop in sup post ab wall🡪gubernaculum(upper part=ovarian lig .lower part=round lig) pulls🡪processes vaginalis passes thru transversalis fascia forms inguinal canal🡪 protrudes into developing labium majora **Lig of Uterus Broad Lig:**bilayered, mesovarium, mesosalpinx. **Suspensory Lig**: suspends ovary. **Ovarian Lig**: attaches ovary to uterus (upper gub) **Round Lig**: restricts post movement of uterus (lower gub)  **NN of Genitals:** superior 3/4=uterogenital N; lower 1/3=deep perineal branch of pudendal

**BLOOD FLOW**:**AA arm**: brachiocephalic🡺subclavian🡺axillary🡺(PHC, AHC, Thoracoac, L.T. Subscap 🡺(thoracodor, cir scap)),brachial🡺(1.deep brachial🡺radial collateral~radial recurrent, middle collateral) (2. sup. ulnar collateral~post.ulnar recurrent) (3.inf. ulnar collateral ~ant. ulnar recurrent)(4. radial🡺rad rec, princeps poll, deep palmar arch,dorsal carpal arch)(5.Ulnar🡺ant ulnar rec, post ulnar rec, sup. palm ar.) **VV arm:** subclavian🡨axillary (1 🡨brachial🡨radial/ulnar) (2.🡨basilic🡨med cub🡨cephalic)(3. 🡨cephalic) **AA leg**: Ex. Iliac🡺Femoral 🡺(1.**popliteal** 🡺 [a.geniculars (1. sup med 2. sup lat 3. inf med 4. inf lat 5. midd) ( popliteal🡺[b.ant tibial 🡺dorsal pedis🡺Deep plantar A, Arcuate🡺Deep plantar arch] (popliteal🡺[c.post tibial🡺fibular, med/lat plantar🡺Deep plantar arch])(popliteal🡺Sural) (2. **deep femoral**🡺circum). **VVleg**: **ANT:** femoral🡨(1.great saph🡨dorsal venous arch)(2.Popliteal🡨ant tib, (post tib🡨fibular),(lesser saph🡨doral v arch)) **AA ant thoracic wall:** aorta🡺brachioceph trunk🡺subclavian🡺internal thoracicA🡺ant intercostals(1-6 off int thor, 7-9 musculo), musculophrenic, sup epigas. **VV of Ant. Thoracic Wall:** sup epigas, musculophrenic, ant intercostals 🡺Internal thoracic🡺 brachiocephalic🡺 SVC. **AA post thoracic wall**: aorta🡺post intercostal, (beneath 12th rib=subcostalA). **VV POST Thoracic Wall: Azygos System** **Right:** 1 intercostal=supreme intercostal🡪R brachiocephalic V; (ascending lumbar, subcostal, superior intercostal, R intercostals & communicating V from hemiazygos)🡪azygos🡪SVC **Left Hemiazygos:** (ascending lumbar, subcostal, intercostals .8-11)🡪hemiazygos🡪 communicating V🡪Azygos **Left Upper VV:** 1-3 intercostals join to form superior intercostal V🡪L brachiocephalic; 4-.7 L post intercostals🡪accessory hemiazygos🡪1.superior intercostal V 2.azygos V **Pulmonary Circulation**: R/L PulmA🡺(LobarA🡺SegmentalA)🡺Pulm Capp🡺gas ex w/ alveoli🡺PulmV🡺Lf atrium **VV:** R Bronchial V🡺AzygosV. L BronchialV🡺Acc HemiazygosV, L Sup intercostals V. IntersegmentalVV🡺Pulm VV. Bronchial AA: supply bronchi, bronchioles, lungs, visceral pleura, trachea. Thoracic Aorta🡺L/R bronchial AA & Esohageal AA **Bronchial VV** R bronchial (& esophogeal V)🡪azygos V; .L bronchial🡪 accessory hemi or L superior intercostal V **Coronary Circulation**: Ascend aorta🡺 (1. **R coronary A** (post)🡺post intervent A🡺branch to AV node; R coronary A (ant)🡺R marginal A, Branch to SA node) (2. **L coronary A**🡺ant .intervent A(widowmaker)🡺diagnal AA; circumflex A🡺L marginal; Branch to SA node) **Pericardium Flow**: subclavian🡺internal thoracic🡺 pericardiacophrenic, musculophrenic; aorta🡺bronchial, esophageal, coronary. Pericardiacophrenic V🡺 BrachiocephalicV, Internal thoracic V. **Portal V** 🡨L/R gastric,sup panreacticoduodenal, cystic, splenic(🡨short gastric, lf gastroepiploic, in mesenteric🡨lf colic, sigmoid, sup rec), sup mesenteric(🡨middle colic, jejunal, ileal, iliocolic, rt. Colic, rt gastroepiploic, sup panreaticoduodenal, inf pancreaticoduodenal) **IVC**🡨hepatic, rt, gonadal, rt, renal, rt inf phrenic, rt. adrenal, lumbar(🡨asending lumbar), L renal🡨lf gonadal, Lf adrenal🡨 Lf inf phrenic),( **Liver Bld Flow** hepatic A & portalV🡪 sinusoids (hepatocytes, exchg takes place) 🡪central V🡪sublobular V🡪hepatic V 🡪IVC **AA of Genitals:** internal iliac🡺 uterine🡺 vaginal**. ovarian & vaginal AA anast\* int/ext pudendalAA🡺ant/post scrotal AA. Femoral A**🡺 ext pudendal🡺 ant. scrotal🡺 int iliac🡺 internal pudendal🡺 post scrotal. **Vaginal VV:** vaginal venous plexus🡺 vaginal V🡺 uterine V🡺 internal iliac V🡺IVC. **Uterine VV:** uterine plexis🡺same as vag. **Ant Division of Internal Iliac A:🡺**umbilical A (🡺obliterated umbilical A, sup vessicular), obturator, inf. Vesical A(supp bladder)(in females from vaginal A), middle rectal, internal pudendal(supp genitalia), inf. Gluteal(supp glut max), vaginal A, uterine A. **Post division of Internal Iliac A**:🡺 sup gluteal, lat sacral, iliolumbar (🡺iliac/ lumbar branches).**Aorta🡺 median sacral A\* \*Inf. Mesenteric A🡺 sup rectal A (\*w/ middle rectal, inf rectal-branch of internal pudendal)**\* **VV**: Int/Ext iliac VV🡺 common iliac🡺 IVC. Sup gluteal🡺 Int. iliac. \*\*L suprarenal, L inf phrenic, L test/ovar🡺L renal🡺IVC\*\* H2T: superior saggital sinus 🡪 confluence🡪 transverse🡪sigmoid🡪IVJ🡪Brachiocephalic V🡪SVC🡪R Atrium🡪Tricuspid🡪R Ventricle🡪Pulmonary SVC🡪Pulmonary Trunk🡪Pulmonary AA🡪R/L Lung🡪 Pulmonary VV🡪L Atria🡪Mitral V🡪L ventricle🡪Aortic SV🡪Aorta (asc/arch/desc)🡪Comm. Iliac🡪Ext Illiac🡪Femoral A🡪Popliteal A🡪Ant Tibial🡪 Doral Pedis🡪(1. Arcuate) (2. Deep Plantar🡪) (3. Post tibial)

FLOW: Liver Lobule: Hepatic A, Portal V🡪Sinusoids 🡪Central V🡪Sublobular V🡪Hepatic VV🡪IVC Sperm: seminiferous tubules🡪rete testis🡪efferent ductules 🡪epididymis head/body/tail🡪vas deferens (+seminal vesicle) 🡪ejac duct🡪prost urethra🡪memb urethra 🡪spongy urethra🡪navicular fossa🡪ext urethral orifice Egg: ovary🡪fallopian tube (fimbria(ostia)🡪infundibulum 🡪amplulla 🡪isthmus)🡪body of uterus🡪isthmus of uterus🡪internal os🡪cervical canal🡪external os🡪vagina, vag orifice. Bile: Hepatocytes (make bile)🡪bile caniculi🡪bile ducts🡪 R&L Hepatic ducts🡪common hepatic duct + cystic duct🡪common bile duct + pancreatic duct→duodenum(via hepatopancreatic ampulla and duodenal papilla) Kidney: cortex🡪renal pyramid(medulla)🡪renal papilla🡪minor calyx🡪major calyx🡪renal pelvis🡪ureter🡪bladder🡪urethra ext urethral orifice Air: Main bronchi(prim)🡪lobar bronchi(sec)🡪segmental b(tert)🡪terminal bronchioles🡪respiratory bb🡪alveolar ducts🡪alveolar sacs (structural unit of gas exchange) Segmental bronchi: supply bronchopulmonary segments.Supplied by segmental brochus A Conducting System of heart: SA Node🡪AV node 🡪AV bundle of His🡪R/L bundle branches🡪 Purkinje fibers🡪mod. band + R/L muscular walls of vents CSF: Choroid plexus🡪lat vents🡪foramen Monroe🡪3rd vent🡪cerebral aqueduct🡪4th vent🡪med/lat aperture🡪subarachnoid space🡪Arachnoid space🡪Arachnoid granulations🡪sup sagital🡪Conflu🡪transverse🡪 sigmoid🡪IJV (inf sag🡪 staight🡪conflu). Venous Sinus: inf sag🡪staight; straight, occipit, sup sag🡪conflu🡪trans, sup/inf petrosal🡪sigmoid, (inf pet🡪IJV \*maybe)(cavernos flows to sup&inf petrosal)

LAYERS: Testis+Scrotum: skin, dartos tunica (superficial) fascia, ext spermatic fascia, cremasteric f/m, int sperm f, parietal/visc layer of tunica vaginalis, tunica albuginea. Penis: skin, superficial fascia, deep fascia, tunica albugenia, corpus cavernosum, tunica albugenia, corpus spongiosum, spongy urethra. Uterus: walls- perimetrium, myometrium, endometrium (mucous layer sloughs).